METEOROLOGICAL OBSERVATIONS *in* IRELAND *in the Year* 1793. *By* RICHARD KIRWAN, *Eſq; LL.D. F. R. S. and M. R. I. A.*

Read Jan. 25, 1794.

IN my former papers on this ſubject I have laid down the rules of probability or meaſures of expectation of the three moſt important ſeaſons of the year, as far as they could be eſtabliſhed by an experience of forty-one years, and determined the limits of each with as much preciſion as the *data* I could collect would admit. The ſeaſons that are conformable to theſe I ſhall therefore call *regular*, and thoſe that deviate from them *anomolous*, until a ſtill longer experience inſtructs us to alter or improve theſe rules. It will therefore be the buſineſs of the meteorologiſt who chuſes to follow this method to exhibit every year a view of the ſeaſons of that immediately preceding, and examine their conformity with

theſe rules. To effect this more eaſily, and without recurring to anterior volumes of our Academy, it may be proper to exhibit a yearly ſhort view of the ſeaſons under their reſpective denominations, and alſo of the meaſures of expectation.

FIRST TABLE.

Seaſons.

Spring 61 Days.			Summer 92 Days.			Autumn 61 Days.		
Rain.			Rain.					
	Inches.	Days.		Inches.	Days.		Inches.	Days.
Wet -	3,78+	36+	Wet -	5,67+	54	Wet -	3,78+	36,+
Variable	3,15±	30±	Variable	4,72±	45±	Variable	3,15±	36,±
Dry -	2,52—	24—	Dry -	3,78—	36—	Dry -	2,52—	24—

SECOND TABLE.

Probabilities at the Beginning of a Year.

1. Spring.		2. Summer.		3. Autumn.	
Wet - -	$\frac{6}{41}$	Wet - -	$\frac{20}{41}$	Wet - -	$\frac{11}{41}$
Variable -	$\frac{13}{41}$	Variable -	$\frac{5}{41}$	Variable -	$\frac{9}{41}$
Dry - -	$\frac{22}{41}$	Dry - -	$\frac{16}{41}$	Dry - -	$\frac{11}{41}$

Of

Of Spring I have as yet no prognoſtics, but it is poſſible that in time the mean height of the barometer in March will furniſh ſome. The mean of March 1792 was 29,707, and the Spring was wet. That of March 1793 was 29,96, and the Spring was variable.

THIRD TABLE.

Probabilities of Summer.

Prognostics.			
Spring	Wet.	Variable.	Dry.
Wet - - -	$\frac{5}{6}$	$\frac{1}{6}$	0
Variable - - -	$\frac{7}{13}$	$\frac{1}{13}$	$\frac{5}{13}$
Dry - - -	$\frac{8}{22}$	$\frac{3}{22}$	$\frac{11}{22}$

FOURTH TABLE.

Probabilities of Autumn.

Prognostics.			
Summer	Wet.	Variable.	Dry.
Wet - - -	$\frac{3}{20}$	$\frac{12}{20}$	$\frac{5}{20}$
Variable - - -	$\frac{3}{5}$	$\frac{1}{5}$	$\frac{1}{5}$
Dry - - -	$\frac{5}{16}$	$\frac{6}{16}$	$\frac{5}{16}$

FIFTH

FIFTH TABLE.

Probabilities of Autumn.

Prognostics.		Wet.	Variable.	Dry.
Wet Spring and	Wet Summer -	$\frac{1}{5}$	$\frac{2}{5}$	$\frac{2}{5}$
	Variable -	$\frac{0}{41}$	$\frac{0}{41}$	$\frac{1}{41}$
	Dry - -	$\frac{0}{41}$	$\frac{0}{41}$	$\frac{0}{41}$
Variable Spring and	Wet Summer -	$\frac{1}{7}$	$\frac{5}{7}$	$\frac{1}{7}$
	Variable -	$\frac{1}{41}$	$\frac{0}{41}$	$\frac{0}{41}$
	Dry - -	$\frac{0}{41}$	$\frac{2}{41}$	$\frac{2}{41}$
Dry Spring and	Wet Summer -	$\frac{0}{41}$	$\frac{6}{8}$	$\frac{2}{8}$
	Variable -	$\frac{2}{3}$	$\frac{1}{3}$	$\frac{0}{41}$
	Dry - -	$\frac{4}{11}$	$\frac{4}{11}$	$\frac{3}{11}$

of

Of the Diſtinctions of Variable.

THE modification called *variable* being intermediate between *dry* and *wet*, may ſometimes approach very nearly (that is, within one or two-tenths) to the one, and ſometimes to the other; and hence I ſhall diſtinguiſh *variable inclining to dry*, and *variable inclining to wet:* it is reaſonable to conclude that when this modification occurs as a *prognoſtic* it ſhould be deemed to participate but in a leſſer degree of the foreboding properties of that modification to which it approaches moſt; and alſo indicate a *leſſer degree* of the modification foreboded, by the prognoſtic to which it approaches. As the prognoſtications however founded on theſe diſtinctions are not the reſult of immediate obſervation, I ſhall comprize them in ſeparate tables, that their validity may be eſſayed by future experience. If found uſeful, they may be enlarged.

SIXTH

SIXTH TABLE.

Probabilities of Summer.

	Prognostics.				
Spring.	Wet.	Variable Wet.	Variable.	Variable Dry.	Dry.
Wet - -	$\frac{5}{6}$	$\frac{4}{6}$	$\frac{1}{6}$	$\frac{1}{41}$	0
Variable - -	$\frac{1}{13}$	$\frac{6}{13}$	$\frac{1}{13}$	$\frac{4}{13}$	$\frac{5}{13}$
Dry - -	$\frac{8}{22}$	$\frac{6}{22}$	$\frac{3}{22}$	$\frac{10}{22}$	$\frac{11}{22}$

SEVENTH TABLE.

Probabilities of Summer.

	Prognostics.		
Spring.	Wet.	Variable.	Dry.
Variable wet - - - -	$\frac{4}{6}$	$\frac{6}{100}$	$\frac{1}{13}$
Dry - - - - -	$\frac{7}{22}$	$\frac{2}{22}$	$\frac{9}{22}$

EIGHTH

EIGHTH TABLE.

Probabilities of Autumn.

PROGNOSTICS.					
Summer.	Wet.	Variable Wet.	Variable.	Variable Dry.	Dry.
Wet - -	$\frac{3}{20}$	$\frac{6}{20}$	$\frac{12}{20}$	$\frac{7}{20}$	$\frac{5}{20}$
Variable - -	$\frac{3}{5}$	$\frac{2}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$
Dry - -	$\frac{5}{16}$	$\frac{4}{16}$	$\frac{6}{16}$	$\frac{4}{16}$	$\frac{5}{16}$

NINTH TABLE.

Probabilities of Autumn.

PROGNOSTICS.			
Summer.	Wet.	Variable.	Dry.
Variable wet - - -	$\frac{2}{20}$	$\frac{10}{20}$	$\frac{4}{20}$
Variable dry - - - -	$\frac{4}{20}$	$\frac{5}{16}$	$\frac{4}{16}$

TENTH TABLE.

Probabilities of Autumn.

PROGNOSTICS.	Wet.	Variable.	Dry.
Wet ſpring, and ſummer variable wet	$\frac{1}{6}$	$\frac{1}{41}$	$\frac{1}{5}$
Summer variable dry	$\frac{1}{41}$	$\frac{1}{41}$	$\frac{1}{41}$
Spring var. wet, and ſummer variable wet	$\frac{1}{7}$	$\frac{1}{41}$	$\frac{1}{6}$
Summer variable dry	$\frac{2}{41}$	$\frac{2}{41}$	$\frac{2}{41}$
Spring var. dry, and ſummer variable wet	$\frac{2}{41}$	$\frac{5}{8}$	$\frac{2}{8}$
Summer variable dry	$\frac{1}{41}$	$\frac{1}{41}$	$\frac{1}{41}$
Dry ſpring, and ſummer variable wet	$\frac{1}{41}$	$\frac{5}{8}$	$\frac{1}{8}$
Summer variable dry	$\frac{3}{11}$	$\frac{3}{11}$	$\frac{5}{11}$

A View

A View of the Weather in 1793.

	Barometer.			Thermometer.			Rain.	
	Higheſt.	Loweſt.	Mean.	Higheſt.	Loweſt.	Mean.	Days.	Inches.
January -	30,68	29,05	30,12	52,	28,	39,32	20	1,8911
February -	30,23	29,14	29,92	55,5	29,	42,17	18	2,1281
March -	30,45	29,33	29,96	55,	31,5	38,27	18	2,0887
April -	30,57	29 42	30,05	60,	31,	44,87	18	2,3645
May - -	30,60	29,27	30,30	67,5	41,	52,06	11	0,6305
June - -	30,47	29,56	30,11	69,5	43,	56,95	22	1,6157
July - -	30,35	29,81	30,16	80,	48,	63,98	20	2,0093
Auguſt -	30,29	29,65	30,05	75,5	48,5	61,51	23	2,0093
September	30,57	29,30	30,16	67,	40,	54,65	14	2,4828
October -	30,68	29,41	30,11	67,	33,	54,04	16	1,1034
November	30,63	29,22	29,90	54,	30,	44,35	17	2,7192
December	30,60	28,68	29,81	55,	32,	43,51	17	1,8128
			30,054			49,64	Total 214	Total 22,8554

THE greateſt height of the barometer, and conſequently the higheſt atmoſpheric tide, was in *October*, the loweſt in *December*; the month during which its mean height was greateſt was *May*; that during which it was loweſt was *December*.

IN 1792 its greateſt height was in *September*, its loweſt in *January*, and the month during which it was higheſt on a mean was *June*, and that in which the mean was loweſt was *March*.

View of the Seaſons.

SPRING.			SUMMER.			AUTUMN.		
	Rain.			Rain.			Rain.	
	Inches.	Days.		Inches.	Days.		Inches.	Days.
April	2,3645	18	June	1,6157	22	September	2,4828	14
			July	2,0093	20			
May	0,6305	11	Auguſt	2,0093	23	October	1,1034	16
	2,9950	29		5,6343	65		3,5862	30

HENCE we ſee the *ſpring was variable*, whether we conſider the quantity of rain or number of days.

THE *ſummer was variable inclining to wet*, if we conſider the quantity of rain, or even *wet*, if we conſider the number of rainy days.

THE

THE *autumn was variable ſlightly inclining to wet*, if we conſider the quantity of rain, but *ſtrictly variable* if we attend only to the number of rainy days.

Compariſon of the Seaſons, with the Rules of Prognoſtication.

1°. THE ſpring being variable, the probability of a *wet* ſummer was the greateſt by the third and ſixth table, being $\frac{7}{13}$, but that of a *variable inclining to wet* was the next greateſt by the ſixth table, being $\frac{6}{13}$, and actually took place.

2°. THE ſummer being variable, the probability of a *wet* autmun was the greateſt by the fourth and eighth table, being $\frac{3}{5}$; but as the ſummer was *variable inclining to wet*, the probability of a variable autumn was alſo the greateſt, by the ninth table, being $\frac{10}{20}$.

3°. A VARIABLE ſpring ſucceeded by a variable ſummer occurred but once in 41 years by Dr. Rutty's obſervations, and theſe were ſucceeded by a wet autumn, therefore its probability ſtood ſingle, and was but $\frac{1}{41}$ by the fifth table; but variable ſprings were ſeven times followed by wet ſummers, and theſe were followed five times out of ſeven by variable autumns, as appears alſo by the fifth table; therefore as this ſummer was variable inclining to wet, the probability that it would be followed by a variable autumn alſo inclining to wet, was the greateſt

greateſt. Hence we may perceive the neceſſity of the diſtinctions of variable, and of enlarging the tables by their admiſſion, ſtill further.

Compariſon of the Years 1792 *and* 1793.

	Rain.		Months.				
	Inches.	Days.	3 Wetteſt.	3 Dryeſt.	Dryeſt.	Mean.	Barometer.
In 1792	28,793 *	228	Auguſt September December	February June November	November	Heat. 50,5	Mean. 29,95
In 1793	22,85	214	November September April	May October June	May	49,6	30,05

In 1792 the winds in March blew 19 days from the W. or S. moſtly from the 12th to the end of the month. In 1793 it blew towards the end of the month chiefly from the eaſt. It is remarkable that though the quantity of rain was different in theſe two years, yet the number of rainy days did not differ much, they being only fewer in 1793 by 14.

In

* By a miſtake this was 30,7 in my laſt paper.

In 1792 they were to the whole year as 10 to 16, and in 1793 as 10 to 17.

It may now be proper to attempt to gain prognoſtics of the different ſeaſons from the ſtate of the winter months that precede them. If we call *winter* thoſe three months in which the greateſt cold uſually prevails and vegetation is arreſted, we may reckon five in every year; three at its beginning, January, February and March, and two at its cloſe, November and December. March indeed may be reckoned intermediate between winter and ſpring, but it partakes more of winter; theſe five months precede the ſucceeding ſeaſons, I ſhall therefore conſider them together under thoſe heads which appear to me moſt likely to furniſh prognoſtics.

Of the Winter preceding the Seaſons of 1792.

1791.	Rain. Inches.	Days.	Mean of Barometer.	Mean Heat.	Storms.
November -	2,1088	22	29,74	43,21	1 W. N. W.
December -	1,8910	18	29,72	36,34	0
	3,9990	40	29,73	39,7	1
1792.					
January -	2,679	21	29,72	39,92	0
February -	1,576*	19	30,01	43,78	0
March - -	1,655†	25	29,70	44,09	9 all S.W. or S. or S. S.W.
	5,910	65	29,81	42,8	9
Total -	9,909	105	29,77	41,66	10

Enſuing

* By error 2,8240 in my laſt paper.

† By error 2,3644 in my laſt paper.

Enſuing Seaſons, Spring *wet*, Summer *wet*, Autumn *wet*.

Of the Winter preceding the Seaſons of 1793.

1792.	Rain. Inches.	Days.	Mean. Barometer.	Mean. Heat.	Storms.
November -	0,3940	14	30,05	48	0
December -	2,9163	17	29,986	42,4	5 W. N. W. or W. S. W.
	3,3103	31	30,01	45,2	5
1793.					
January -	1,8911	20	30,12	39,32	0
February -	2,1281	18	29,92	42,17	2 S. W. N. W.
March - -	2,0887	18	29,96	38,27	2 S. W. before the 3d.
	6,1079	56	30, Mean	39,92	4
Total -	9,4182	87	30, Mean	42,5	9

ENSUING ſeaſons, ſpring *variable*, Summer *variable inclining to wet*, autumn *variable ſlightly inclining to wet*.

AMONG all the years obſerved by Dr. Rutty from 1725 to 1765, there occurs but one ſimilar to 1792, viz. the year 1755; in that the three ſeaſons, ſpring, ſummer and autumn, were wet; and by comparing my journal with his account, I find many other points of reſemblance; it were perhaps worth examining how far they reſembled each other with reſpect to human health.

The

The year 1756 bore alſo ſome reſemblance to 1793, for the ſpring was variable, the ſummer wet, and the autumn variable.

Mr. Barker of Lyndon in England remarked that 1792 was the wetteſt year that occurred ſince 1782. The mean height of the barometer at Lyndon is 29,4 and the mean annual rain is about 23; but this year there fell 29,4 inches. The mean height of the barometer in March was about $\frac{2}{10}$ below its ſtandard height.